

Development and Testing of the new Surface LER Climatology for OMI UV Aerosol Retrievals



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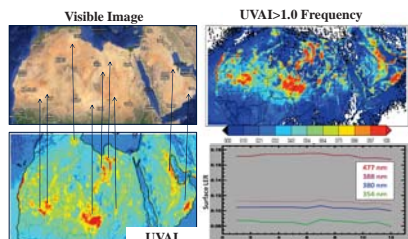
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Objective:

To derive monthly global climatology of surface LER at 388 and 354 nm using 7 years (2005-2011) of OMI observations. This will replace TOMS LER (380 and 354 nm) climatology in OMI near UV Aerosol Retrieval Algorithm.

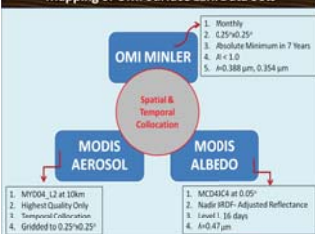
- To produce high resolution (0.25x0.25) surface LER data sets for aerosol retrieval.
- To produce self (OMI) consistent surface data.
- To produce wavelength consistent LER climatology (OMI: 388, 354 vs TOMS: 380, 354*)



Existing OMI data (TOMS surface) shows consistent high UVAI values, which appeared as (visible) surface feature over Sahara and Arabian Peninsula.

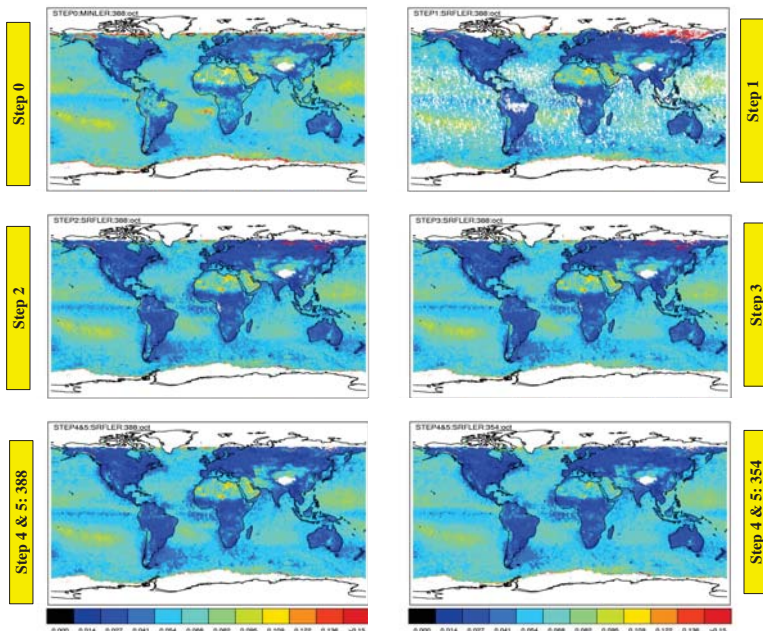
Approach & Data

Mapping of OMI Surface LER: Data Sets

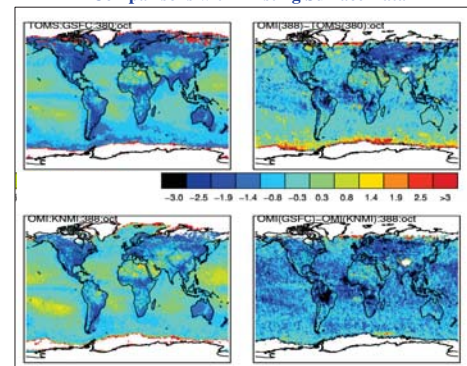


Start with OMI MINLER <0.25	Deriving Surface LER – 6 Step Process
Step 1 (AOD correction & Seasonal Adjustment)	Land – All time OMI MINLER at 388 nm is adjusted for seasonality of MODIS surface albedo Ocean – MODIS AOD corrections were made for each month
Step 2 (Temporal Filling)	In tropics (130°) – Gaps were filled using nearest available month In mid latitude (30-70) – Gaps were filled using nearest (<2) available month
Step 3 (Spatial Smoothing/Filling)	3x3 grid running spatial averaging performed Empty grids in 3x3 grid box were filled with average value
Step 4 (Remaining Gaps filled with all time MINLER)	Remaining gaps in (150°) were filled using all time MINLER
Step 5 (MINLER >0.25 inclusion)	MINLER > 0.25 were included for each month in the data base without any correction.
Step 6 (Final) - Fresnel Corrections over Ocean - Fending	

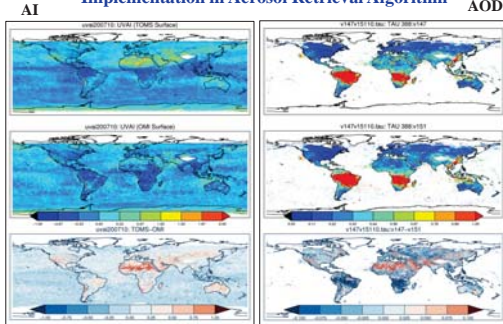
Method: step by step result for October: 388 nm



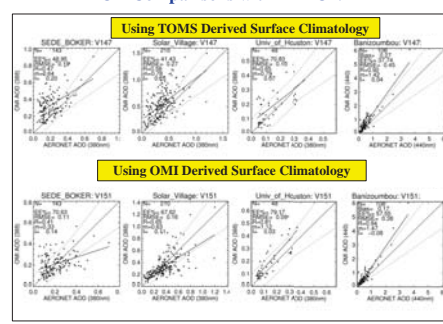
Comparisons with Existing Surface Data



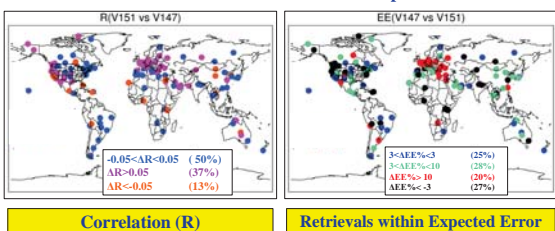
Implementation in Aerosol Retrieval Algorithm



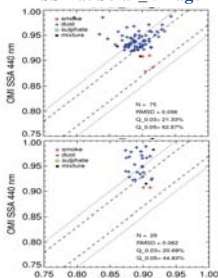
AOD Comparisons with AERONET



Global Statistics of AERONET Comparisons



SSA at Solar_Village



Summary/Ongoing Work

- New surface LER monthly climatology for OMI's near UV aerosol retrieval is developed at 354 nm and 388 nm.
- The new data sets will provide high resolution, instrument and wavelength consistent surface LERs.
- Inter-comparisons with existing TOMS based climatology and OMLER product show regional differences and similarities.
- Initial testing of AOD and SSA retrieval show improvement over dust areas and consistent with existing retrieval everywhere else.
- More testing and refinement in the LERs climatology and retrieval algorithm is in progress.